

## I CLAIM:

## 1. A chuck assembly comprising:

a housing that defines a cylindrical inner space therein and that is formed with a hydraulic fluid inlet adapted to be connected to a hydraulic fluid supply;

a sleeve that is co-axially mounted in said inner space, that is secured to said housing, that defines a rotary-receiving space therein, and that is formed with an annular groove in fluid communication with said hydraulic fluid inlet;

a rotary unit co-axially and rotatably extending through said rotary-receiving space, cooperating with said sleeve to define a clearance therebetween, and including a hollow shaft that defines a chuck-receiving space therein, that is rotatable relative to said sleeve about an axis, and that is formed with a first fluid passage in fluid communication with said annular groove, said clearance being in fluid communication with said annular groove;

a chuck unit that is co-axially mounted in said chuck-receiving space, that includes a plurality of angularly displaced jaws, and that cooperates with said shaft to define a piston-receiving chamber therebetween;

a piston that is co-axially mounted in said

piston-receiving chamber, that subdivides said piston-receiving chamber into first and second compartments, that is displaceable in an axial direction relative to said axis, and that is connected to said chuck unit in such a manner that axial displacement of said piston results in radial displacement of said jaws, said first compartment being in fluid communication with said first fluid passage so as to permit entry of the hydraulic fluid therein, which, in turn, results in axial displacement of said piston; and

a cooling mechanism having an air inlet that is formed in said housing and that is adapted to be connected to an air supply, and an air channel that is formed in said sleeve and that is in fluid communication with said air inlet and said annular groove so as to permit entry of an air flow into and through said clearance upon actuation of the air supply.

2. The chuck assembly of Claim 1, wherein said rotary unit further includes a bearing spacer ring that is sleeved on said shaft and that cooperates with said sleeve to define said clearance therebetween, said bearing spacer ring being formed with a second fluid passage that is in fluid communication with said first fluid passage and said annular groove.

3. The chuck assembly of Claim 2, wherein said sleeve

is further formed with an oil channel that is in fluid communication with said annular groove in said sleeve and said hydraulic fluid inlet in said housing.

4. The chuck assembly of Claim 3, wherein said housing  
5 is further formed with an oil outlet that is adapted to be connected to an oil collector, said sleeve being formed with a second oil channel that is in fluid communication with said oil outlet in said housing and said annular groove in said sleeve.

10 5. The chuck assembly of Claim 2, further comprising an urging member that is mounted in said second compartment and that abuts against said piston so as to accumulate a restoring force when the hydraulic fluid enters into said first compartment and moves  
15 said piston to compress said urging member.